

Original Research

Analysis of lip print and fingerprint patterns in patients with type II diabetes mellitus

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ABSTRACT:

Background: To analyze the lip print and fingerprint patterns in patients with type II diabetes mellitus. **Materials & methods:** A total of 50 subjects were enrolled. Out of which 25 were the case group and 25 healthy individuals without diabetes and without any family history of diabetes were taken as controls. Lip prints were taken and were categorized into 6 categories as type I, type I', type II, type III, type IV and type V. Fingerprint patterns were collected and categorized as loops, whorls and arches. Data was collected and analysed using chi-square test. **Results:** A total of 50 subjects were considered. The age group taken under consideration was 20-50 years. Comparison of lip print patterns in cases were type I 8%, type I' 5%, type II 3%, type III 18%, type IV 60% and type V 6% whereas in controls type I 28%, type I' 2%, type II 38%, type III 13%, type IV 16% and type V 3%. The difference in lip print patterns between cases and controls were statistically significant ($P < 0.001$). **Conclusion:** Cheiloscopy shows significant result in diabetic patients.

Keywords: diabetes mellitus, cheiloscopy, fingerprint patterns.

Received: 11-11- 2018

Accepted: 16-12-2018

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This article may be cited as: Farooq F, Bhatt RA. Analysis of lip print and fingerprint patterns in patients with type II diabetes mellitus. *J Adv Med Dent Sci Res* 2019;7(1):251-254.

INTRODUCTION

Fingerprints or fingertip patterns are formed by epidermal ridges which form around 6–8 weeks following conception. These appear as volar pads which undergo recession at approximately 10–12 weeks. Skin ridges appear at the 13th week. These patterns get completed at 21 weeks. Once formed, these ridge patterns do not undergo any change. ⁽¹⁾ The term “cheiloscopy” has been derived from Greek “cheilos” which means lips and “skopein” which means “to see.” ⁽²⁾ Fisher in 1902 was the first person to describe lip print patterns, while Edmond Locard was the first individual to recommend cheiloscopic analysis for identification of humans. ⁽³⁾

The lip patterns or cheiloscopic patterns are constituted by furrows and lines present on the vermilion border of lips. These have patterns identical to those of fingerprint patterns. ⁽⁴⁾ These patterns are characteristic fissure patterns or sulci labiorum which present as depressions along with elevations. These patterns remain unchanged in climate, minor trauma, inflammatory, and herpetic ulcerations. ⁽⁵⁾

Diabetes mellitus (DM) is a chronic metabolic disorder characterized by persistent hyperglycemia. It may be due to impaired insulin secretion, resistance to peripheral actions of insulin, or both. According to the International Diabetes Federation (IDF), approximately 415 million adults between the ages of 20 to 79 years had diabetes mellitus in 2015. ⁽⁶⁾ DM is proving to be a global public health burden as this number is expected to rise to another 200 million by 2040. DM is broadly classified into three types by etiology and clinical presentation, type 1 diabetes, type 2 diabetes, and gestational diabetes (GDM). ⁽⁷⁾ T2DM is a complex disorder of general metabolism and is currently thought to occur in genetically predisposed individuals who are exposed to a series of environmental influences that precipitates the onset of disease. It accounts for approximately 90%–95% of all diabetes. The clinical symptoms of T2DM are varied, and there are fewer efforts among individuals to assess their biochemical levels of blood or urine for glucose. Furthermore, the cost involved in these assessments is high. It is estimated that in about 50% of affected people the disease is undiagnosed. ⁽⁸⁾

MATERIALS & METHODS

A total of 50 subjects were enrolled. Out of which 25 were the case group and 25 healthy individuals without diabetes and without any family history of diabetes were taken as controls. A regular follow up was done. Laboratory investigations such as fasting blood sugar levels and HbA1C levels were evaluated. Lip prints were taken and were categorized into 6 categorised as type I, type I', type II, type III, type IV and type V. Finger print patterns were collected and categorised as loops, whorls and arches. Data was collected and analysed using chi-square test. Results were obtained and analysed under SPSS software.

RESULTS

A total of 50 subjects were considered. The age group taken under consideration was 20-50 years. Comparison of lip print patterns in cases were type I 8%, type I' 5%, type II 3%, type III 18%, type IV 60% and type V 6% whereas in controls type I 28%, type I' 2%, type II 38%, type III 13%, type IV 16% and type V 3%. The difference in lip print patterns between cases and controls were statistically significant (P = <0.001). The distribution of fingerprint patterns of right hand for categories in the case groups were for the loops was 60%, whorls 35% and arches 5% and left hand for loops 54%, whorls 32% and arches 14%. The difference in finger print patterns for case and controls was statistically insignificant.

Table 1: comparison of lip print patterns in case and controls

Lip patterns	% of distribution of lip prints in cases	% of distribution lip prints in controls
Type I	8%	28%
Type I'	5%	2%
Type II	3%	38%
Type III	18%	13%
Type IV	60%	16%
Type V	6%	3%

Graph 1: Comparison of lip print patterns in case and controls

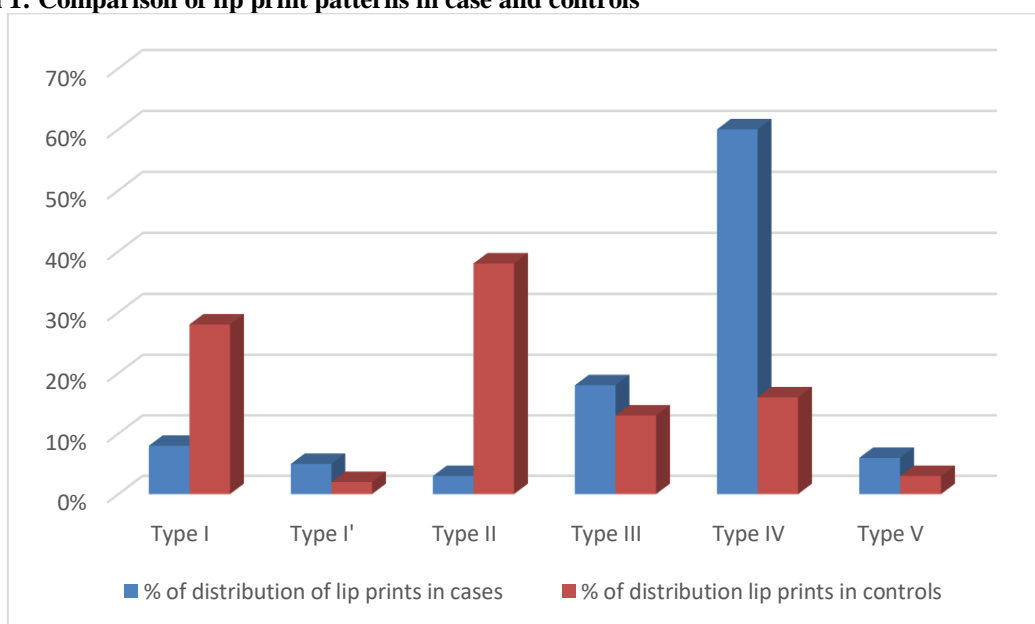
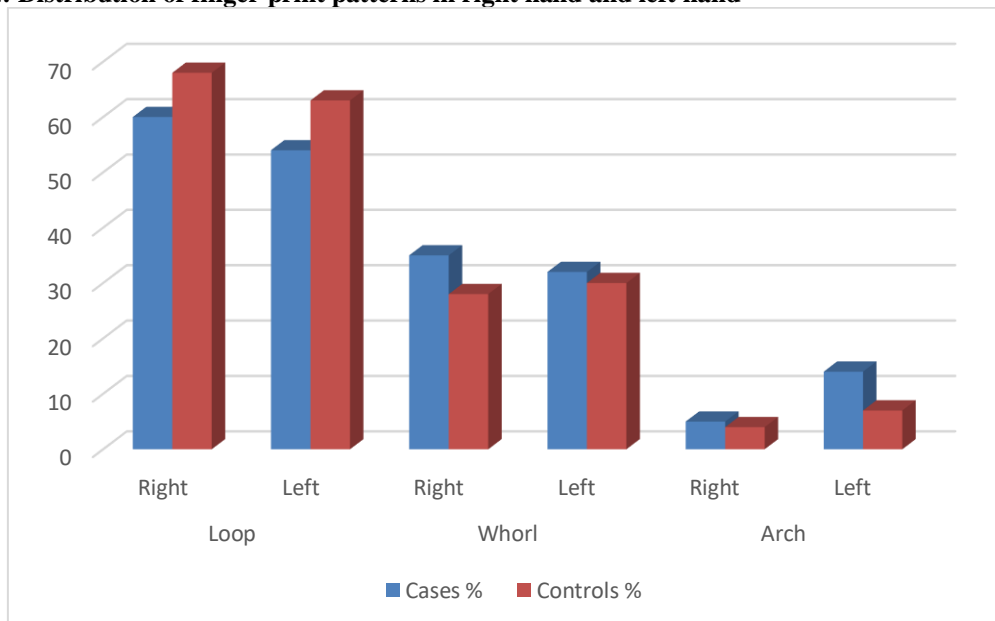


Table 2: Distribution of finger print patterns in right hand and left hand

Finger print pattern	Cases %	Controls %
Loop		
Right	60	68
Left	54	63
Whorl		
Right	35	28
Left	32	30
Arch		
Right	5	4
Left	14	7

Graph 2: Distribution of finger print patterns in right hand and left hand



DISCUSSION

The prevalence of DM is rising at a deplorable rate worldwide. Diabetes was once considered to be a mild malady of the elderly, howbeit presently, it is one of the prime causes of morbidity and mortality affecting the youth also. The WHO projects that diabetes will be the 7th leading cause of death in 2030. (9) The majority of diabetes (~90%) is T2DM caused by the amalgamation of impaired insulin secretion from pancreatic beta cells and insulin resistance of the peripheral target tissues, particularly muscle and liver. (10)

Lip prints and fingerprints are genetically determined and form a pattern that is unique for each individual. T2DM, having a strong genetic background, can be influenced by these dermatoglyphic features. Furthermore, lip print and fingerprint analysis is simple and non invasive methods, when compared with biochemical tests for T2DM. Footprints can also be used for similar anatomization. Record on the comparative study of lip print and fingerprint analysis with T2DM is exiguous in literature. (11) In our study, a total of 50 subjects were considered. The age group taken under consideration was 20-50 years. Comparison of lip print patterns in cases were type I 8%, type I' 5%, type II 3%, type III 18%, type IV 60% and type V 6% whereas in controls type I 28%, type I' 2%, type II 38%, type III 13%, type IV 16% and type V 3%. The difference in lip print patterns between cases and controls were statistically significant (P = <0.001). Both dermatoglyphic and cheilosopic patterns are genetically determined. These patterns are known to be associated with type II diabetes or diabetes mellitus and hypertension which are also considered to have genetic influence due to their familial occurrence. One of the study was a prospective study conducted on 300 study participants. Both cheilosopic and dermatoglyphic

patterns were recorded using validated techniques. (12) No statistical correlation was obtained between either dermatoglyphic or cheilosopic patterns and type II diabetes or hypertension. They showed that cheiloscopy or dermatoglyphics cannot be used as a predictive tool for assessing a subject's risk of developing type II diabetes or hypertension. These are contradictory findings, thus emphasizing more research in this area so that these noninvasive techniques can be used as predictive tools for developing essential hypertension or type II diabetes. (13) In our study, the distribution of fingerprint patterns of right hand for categories in the case groups were for the loops was 60%, whorls 35% and arches 5% and left hand for loops 54%, whorls 32% and arches 14%. The difference in finger print patterns for case and controls was statistically insignificant. Other study was conducted on 100 uncontrolled T2DM patients and 50 healthy controls. Lip prints were obtained using lipstick and cellophane paper analyzed and classified using Suzuki and Tsuchihashi's classification. Type IV pattern of lip prints was found significantly more in the diabetic patients. Howbeit, fingerprint analysis did not reveal any significant association with diabetes. They showed a ray of hope for application of cheiloscopy as a potential biomarker in the early diagnosis of T2DM which can be used in mass screening. (14)

CONCLUSION

Cheiloscopy shows significant result in diabetic patients.

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